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ABSTRACT

As an extensive to an earlier report on pilot shows of The Electric Company that produced high and low visual attention in 2nd and 3rd graders, this study focuses on the effect of contextual attributes on the level of appeal. By analyzing sequences of presentations of bits of information, researchers found that bits of similar appeal levels tend to follow each other, and that the appeal of a bit is enhanced by following a bit with high appeal. While the attention given to one bit influences the attention given to the following bit, the influence extends no further. This suggests that high-value, low-appeal bits should follow high-appeal bits. Also, if a bit lasts more than one minute, its carry over effect diminishes. (EMH)

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THE INFLUENCE OF CONTEXT

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THE ELECTRIC COMPANY DISTRACTOR DATA:

THE INFLUENCE OF CONTEXT

This paper is an extension of an earlier report, "Attributes of 'The Electric Company' pilot shows that produced high and low visual attention in 2nd and 3rd graders." The same body of data was used.

The earlier study had focused on the intrinsic attributes related to visual appeal. The present study looks at the effects of contextual attributes. It also outlines a system that uses both intrinsic and contextual attributes to estimate appeal.

The Effect of Context Alone

The level of attention of one bit is related to the level of attention of the bit that precedes it. Bits with similar scores (both higher than average or both lower than average) follow each other 2.6 times as often as do bits with dissimilar scores.

If one is examining untested materials and therefore does not know the level of response given to a preceding bit, one can estimate its score from its intrinsic attributes and still achieve fair accuracy. The response to

bits following those with all high- or low-appeal attributes was consistent at a ratio of 2.1 to 1.

For a comparison of the relationship between adjacent bits with the relationship of bits separated from each other by one, all three-bit sequences in the shows were looked at, and the frequences of occurance of each of the possible combinations of high and low scores were tabulated. Table 1 gives the results.

Over all, the second and third bits were similar 103 times and dissimilar 37 times. In terms comparable to the analysis of intrinsic attributes in the previous paper, the contextual attribute "level of attention given to preceding bit" accounts for the scores of the bits that follow at a ratio of 2.8 to 1.[1]

In comparison, the first and third bits were similar 85 times and dissimilar 55 times. The attribute "level of attention given to the bit that precedes the preceding bit" differentiated the scores of bits at a ratio of 1.5 to 1.[2] This is about what one would expect if the first were affecting the second at 2.8 to 1 and the second affecting the third at 2.8 to 1. In other words, there is no evidence that the first affects the third at all.

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[1] This figure was derived from looking at all the three-bit sequences. It compares those in which the last two bits scored similarly with those in which the last two were different. (+++) & (-++) & (---) & (+--) = 103. (++-) & (+-+) & (-+-) & (--+) = 37.

[2] This figure compares the number of sequences in which the first and third bits were similar with those in which they were different, irrespective of the score of the second bit. (+++) & (+-+) & (---) & (-+-) = 85. (++-) & (+--) & (-++) & (--+) = 55.

Table 1

Frequencies of Occurance of Each Possible Three-Bit Sequence of High- and Low-Scoring Bits

Sequence	Frequency
(+ + +)	52
(+ + -)	15
(+ - +)	6
(+ - -)	13
(- + +)	15
(- + -)	4
(- - +)	12
(- - -)	23

Because these overall figures took account of only two of the three bits in each sequence, finer-grained analyses were performed that considered the effects of all three.

First, sequences with three similar-scoring bits in a row were compared with those in which there were only two similar bits in a row (two in a row and one different or one different and two in a row).[1] In both comparisons, the three-in-a-row sequences occurred 2.8 times as often as the other type (75 to 27 and 75 to 28).

Second, those sequences with two in a row followed by one different were compared with the sequences in which each bit was different from the one that preceded it.[2] Here, too, the ratio was 2.8 to 1 (28 to 10).

One can be quite certain from these findings that the influence of two in a row is no stronger than one alone upon the response to the bit that follows. The relationship between the second and the third bit is the same, no matter what the response to the first one was.

In sum, then, while the attention given to one bit influences the attention given to a following bit, that influence extends no further. Another line of evidence supports the same conclusion. An examination of bits with no intrinsic attributes or with equal numbers of high- and low-appeal intrinsic attributes shows that although children's response to them can be accounted for by the appeal of bits immediately preceding them, this appeal is not related to the response to bits that immediately

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[1] (+++) & (---) versus (++-) & (--+) or (--+) & (+--).

[2] (-++) & (+--) versus (-+-) & (+-+).

follow them, e.g., the context effect lasts through one bit and no further.

There are a number of important implications of these findings.

One is that producers cannot afford to let appeal sag anywhere. Visual attention can drop as quickly after a number of good bits as it can after a single good bit in a series of bad ones. There would appear to be little net difference between alternating attractive and unattractive bits and putting them in blocks of several good and several bad together. One can probably sustain attention across one visually unappealing bit, though, provided it is cradled by very highly appealing bits on either side.

A qualification should be made at this point, however. The evidence examined in this study involved only three-bit sequences, so the comparisons were made between the effects of two in a row or one alone. It may be that longer strings, say five in a row, would begin to exert a cumulative effect. Children might be more forgiving of a bad bit, then, and more ready to respond favorably to a bit that follows it in turn. Since strings of five or more in a row were so infrequent in these shows, it is impossible to decide on this point.

Another implication is that if a particular bit is needed to teach an important concept, and none of the high-appeal intrinsic attributes can be built into it, then it should be placed immediately following a very high-appeal bit, and this context will insure children's attention to the one in question.

Related to this point is the implication that a bit may be justified

from the point of popularity alone, even if it has no internal educational function of its own, since it can be used to increase the attention to an important bit.

A General System for Estimating Appeal

This section summarizes my attempts to relate intrinsic attributes to contextual ones, and to use them together to achieve the best possible accounting of children's responses to all the bits in the five shows.

First, it was found that to estimate the appeal of a given bit, one should use only the intrinsic attributes of the bit preceding it. The contextual attributes of this adjacent bit do not exert a contextual influence on the one that follows.

Second, it was found best not to make any estimate of the response to bits possessing no intrinsic qualities.

Third, it was found that context exerts a minimal influence on response to bits longer than one minute. Apparently this is sufficient time for children to adjust from previous levels of response and to react according to the intrinsic qualities alone. Accordingly, one should not use context to estimate children's response to long bits.

Since it was possible to determine context attributes from intrinsic attributes, it was possible to use both to estimate children's responses.

The system found to be best at making these estimates is quite simple:

1. If the bit lasts one minute or longer, compare the numbers of high- and low-appeal intrinsic attributes.

2. If the bit lasts less than one minute, take its own intrinsic attributes together with the intrinsic attributes of the preceding bit and compare the total numbers of high- and low-appeal attributes.

3. If there are more high-appeal than low-appeal attributes, estimate a high level of response.

4. If there are more low-appeal than high-appeal attributes, estimate a low level of response.

5. If there are equal numbers of high- and low-appeal attributes, or if there are no intrinsic attributes at all, make no prediction.

Following this system, children's responses to 89 bits can successfully be accounted for, with no estimates made for 48 bits. This is a success ratio of 7.4 to 1 for 68% of all bits in the shows. It compares 3.9 to 1 for 81% using intrinsic attributes alone and 2.1 to 1 for 72% using contextual attributes alone.